Radiation – Safety Checklist



Radiation or **Electromagnetic Radiation (EMR),** is energy in a wave form. An **Electromagnetic Field (EMF)** is made up of an electric field and a magnetic field. **EMFs** occur naturally and also come from sources created by human activity. Natural **EMFs** comes from sources such as the earth's own magnetic field, electrical storms, the sun and even the body's own essential electric activity. **Manufactured EMFs**, come from overhead power lines, electric wiring in buildings, radio towers, and laser tools. It is these that are of more concern. **EMR** can be either ionizing or non-ionizing.

Ionizing radiation is high frequency and high-energy and can penetrate the body – it has enough energy to break up atoms and molecules as it passes through the body (i.e., it can cause ionization).

Ionizing radiation occurs as either electromagnetic rays (X-rays and gamma rays) or particles **(such alpha and beta particles).**

- **Alpha particles** can be easily stopped (energy absorbed) by a piece of paper.
- **Beta particles** can penetrate one or two centimeters of human tissue – but can be stopped by glass or metal.
- Gamma rays and X-rays are waves of energy similar to visible light; except they have more energy and are invisible. They travel at the speed of light and penetrate matter more easily. They can be screened by lead, concrete or water.

WHERE DO YOU FIND IONIZING RADIATION?

Most ionizing radiation in industry is due to X-rays. Equipment which emits X-rays can be found in:

- Medical and dental diagnostic and therapeutic radiography;
- Industrial radiography for detection of faults in welding or metal castings;
- Testing instruments such as thickness gauges in sheet metal, plastic and paper production.

HEALTH EFFECTS OF EXPOSURE TO IONIZING

When radiation is absorbed in the body it causes chemical reactions to occur

which can alter the normal functions of the body. At high doses this can result in massive cell death, organ damage and even death. At low closes the situation is more complex.

It is well documented in the public domain that the human body is composed of brain cells, muscle cells, blood cells etc. Ionizing radiation affects the tissues of the body.

Low closes of radiation can damage the genes. The following are harmful effects:

- Radiation Sickness
- Cancer
- Genetic Defects & Reproductive Toxicity
- Cataracts
- Nervous System Effects
- Cardiovascular Effects